CLAIMS

We claim:

1. A system for processing markup data for a map on a personal digital assistant comprising:

 $b_{\mathcal{N}}$

- (a) a personal digital assistant;
- (b) an application on the personal digital assistant, the application configured to:
 - (i) obtain a map as an encoded and spatially indexed vector representation of geographic data from a server;

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- (ii) display the map on a screen of the personal digital assistant;
- (iii) obtain markup data comprised of pixel data from a user that utilizes a stylus to markup the map displayed on the personal digital assistant;
- (iv) create a file comprised of the markup data;

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- (v) upload the file of markup data from the personal digital assistant to the server.
- 2. A system for processing mark up data for a map comprising:
- (a) a personal digital assistant; and

- (b) an application on the personal digital assistant, the application configured to:
 - (i) obtain a file comprised of markup data for a map; and
 - (ii) upload the file to a server.

- 3. The system of claim 2 wherein the markup data comprises pixel data for a markup entity.
- 5 4. The system of claim 2 wherein the personal digital assistant obtains the file by obtaining markup data from a user.
 - 5. The system of claim 4 wherein the markup data is a redline line.
- 10 6. The system of claim 5 wherein the application configured to obtain the markup data from a user is further configured to:
 - (a) determine when a new redline object has been selected; and
 - (b) obtain a redline object while a stylus remains in contact with a screen of the personal digital assistant.

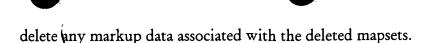
7. The system of claim 6, the application configured to obtain further configured to:

- (a) display a text edit dialog box on the screen of the personal digital assistant; and
- 20 (b) accept text user input in the text edit dialog box.
 - 8. The system of claim 4 wherein the markup data is a note.





- 9. The system of claim 8 wherein the application configured to obtain the markup data from a user is further configured to:
 - (a) determine when a new note object has been selected;
- (b) accept a user selection of an anchor point in a display of a map on the personal digital assistant;
 - (c) display a text entry screen on the personal digital assistant;
 - (d) accept text user input in the text entry screen; and
 - (e) display an icon representative of a note at the anchor point.
- 10 10. The system of claim 2 wherein the application uploads the data to a server by:
 - (a) obtaining a socket connection;
 - (b) obtaining an inventory of resident mapsets;
 - (c) searching for markup data associated with the resident mapsets; and
- 15 (d) uploading all resident markup data to the server.
 - 11. The system of claim 10 wherein the markup data is uploaded to a server directory on the server using a hypertext transfer protocol PUT request.
- 20 12. The system of claim 10, the application on the personal digital assistant further configured to:
 - (a) download any new mapsets;
 - (b) delete unreferenced mapsets; and

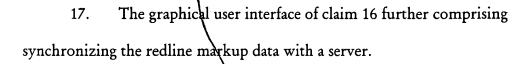


- 13. A system for processing mark up data for a map comprising a server configured to:
 - (a) obtain a file comprised of markup data for a map;

(c)

- (b) convert the markup data to coordinate data; and
- (c) use the coordinate data to obtain a standard data format (SDF) file that can be used to superimpose the markup data on the map.
- 10 14. The system of claim 13 wherein the coordinate data comprises mapping coordinate system (MCS) coordinates and the server is further configured to convert the MCS coordinates to latitude/longitude coordinates.
- 15. A graphical user interface for obtaining redline markup data for a

 15 map on a personal digital assistant, the graphical user interface comprising:
 - (a) determining when a new redline object has been selected; and
 - (b) obtaining a redline object while a stylus remains in contact with a screen of the personal digital assistant.
- 20 16. The graphical user interface of claim 15 further comprising:
 - (a) displaying a text edit dialog box on the screen of the personal digital assistant; and
 - (b) accepting text user input in the text edit dialog box.



- 5 18. A graphical user interface for obtaining note markup data for a map on a personal digital assistant, the graphical user interface comprising:
 - (a) determining when a new note object has been selected;
 - (b) accepting a user selection of an anchor point in a display of a map on a personal digital assistant;
- 10 (c) displaying a text entry screen on the personal digital assistant;
 - (d) accepting text user input in the text entry screen; and
 - (e) displaying an icon representative of a note at the anchor point.
- 19. The graphical user interface of claim 18 further comprising synchronizing the redline markup data with a server.
 - 20. A method for processing mark up data for a map comprising:

 obtaining a file comprised of markup data for a map on a personal digital assistant; and
- 20 uploading the file from the personal digital assistant to a server.
 - 21. The method of claim 20 wherein the markup data comprises pixel data for a markup entity.

- 22. The method of claim 20 wherein the obtaining comprises obtaining markup data from a user.
- 5 23. The method of claim 22 wherein the markup data is a redline line.
 - 24. The method of claim 23 wherein the obtaining the markup data from a user comprises:
 - (a) determining when a new redline object has been selected; and
- 10 (b) obtaining a redline object while a stylus remains in contact with a screen of the personal digital assistant.
 - 25. The method of claim 24, the obtaining further comprising:
- (a) displaying a text edit dialog box on the screen of the personal digital

 15 assistant; and
 - (b) accepting text user input in the text edit dialog box.
 - 26. The method of claim 22 wherein the markup data is a note.
- 27. The method of claim 26 wherein the obtaining the markup data from a user comprises:
 - (a) determining when a new note object has been selected;
 - (b) accepting a user selection of an anchor point in a display of a map on

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the personal digital assistant;

- (c) displaying a text entry screen on the personal digital assistant;
- (d) accepting text user input in the text entry screen; and
- (e) displaying an icon representative of a note at the anchor point.
- 28. The method of claim 20 wherein the uploading the data to a server comprises:
 - (a) obtaining a socket connection;
 - (b) obtaining an inventory of resident mapsets;
- 10 (c) searching for markup data associated with the resident mapsets; and
 - (d) uploading all resident markup data to the server.
 - 29. The method of claim 28 wherein the markup data is uploaded to a server directory on the server using a hypertext transfer protocol PUT request.
 - 30. The method of claim 28 further comprising:
 - (a) downloading any new mapsets;
 - (b) deleting unreferenced mapsets;\and
 - (c) deleting any markup data associated with the deleted mapsets.
 - 31. A method processing mark up data for a map comprising:
 - (a) obtaining a file comprised of markup data for a map;
 - (b) converting the markup data to coordinate data; and

- (c) using the coordinate data to obtain a standard data format (SDF) file that can be used to superimpose the markup data on the map.
- 32. The method of claim 31 wherein the coordinate data comprises

 mapping coordinate system (MCS) coordinates and the method further comprises

 converting the MCS coordinates to latitude/longitude coordinates.
 - 33. A method for obtaining redline markup data for a map on a personal digital assistant, the method comprising:
 - (a) determining when a new redline object has been selected; and
 - (b) obtaining a redline object while a stylus remains in contact with a screen of the personal digital assistant.
 - 34. The method of claim 3\frac{3}{3} further comprising:
- 15 (a) displaying a text edit dialog box on the screen of the personal digital assistant; and
 - (b) accepting text user input in the text edit dialog box.
- 35. The graphical user interface of claim 34 further comprising synchronizing the redline markup data with a server.
 - 36. A method for obtaining note markup data for a map on a personal digital assistant, the method comprising:

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- (a) determining when a new note object has been selected;
- (b) accepting a user selection of an anchor point in a display of a map on a personal digital assistant;
 - (c) displaying a text entry screen on the personal digital assistant;
 - (d) accepting text user input in the text entry screen; and
 - (e) displaying an icon representative of a note at the anchor point.
- 37. The graphical user interface of claim 36 further comprising synchronizing the redline markup data with a server.

38. An article of manufacture comprising a program storage medium readable by a computer hardware device and embodying one or more instructions executable by the computer hardware device to perform a method for processing markup data for a map, the method comprising:

obtaining a file comprised of markup data for a map on a personal digital assistant; and

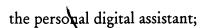
uploading the file from the personal digital assistant to a server.

- 39. The article of manufacture of claim 38 wherein the markup data comprises pixel data for a markup entity.
 - 40. The article of manufacture of claim 38 wherein the obtaining comprises obtaining markup data from a user.

- 41. The article of manufacture of claim 40 wherein the markup data is a redline line.
- 42. The article of manufacture of claim 41 wherein the obtaining the markup data from a user comprises:
 - (a) determining when a new redline object has been selected; and
 - (b) obtaining a redline object while a stylus remains in contact with a screen of the personal digital assistant.

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- 43. The article of manufacture of claim 42, the obtaining further comprising:
- (a) displaying a text edit dialog box on the screen of the personal digital assistant; and
- (b) accepting text user input in the text edit dialog box.
 - 44. The article of manufacture of claim 40 wherein the markup data is a note.
- 20 45. The article of manufacture of claim 44 wherein the obtaining the markup data from a user comprises:
 - (a) determining when a new note object has been selected;
 - (b) accepting a user selection of an anchor point in a display of a map on



- (c) \ displaying a text entry screen on the personal digital assistant;
- (d) accepting text user input in the text entry screen; and
- (e) displaying an icon representative of a note at the anchor point.
- 46. The article of manufacture of claim 38 wherein the uploading the data to a server comprises:
 - (a) obtaining a socket connection;
 - (b) obtaining an inventory of resident mapsets;
- 10 (c) searching for markup data associated with the resident mapsets; and
 - (d) uploading all resident markup data to the server.
- 47. The article of manufacture of claim 46 wherein the markup data is uploaded to a server directory on the server using a hypertext transfer protocol

 15 PUT request.
 - 48. The article of manufacture of claim 46, the method further comprising:
 - (a) downloading any new mapsets;
- 20 (b) deleting unreferenced mapsets; and
 - (c) deleting any markup data associated with the deleted mapsets.
 - 49. An article of manufacture comprising a program storage medium

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readable by a computer hardware device and embodying one or more instructions executable by the computer hardware device to perform a method for processing markup data for a map, the method comprising:

- (a) obtaining a file comprised of markup data for a map;
- (b) converting the markup data to coordinate data; and
- (c) using the coordinate data to obtain a standard data format (SDF) file that can be used to superimpose the markup data on the map.
- 50. The article of manufacture of claim 49 wherein the coordinate data comprises mapping coordinate system (MCS) coordinates and the method further comprises converting the MCS coordinates to latitude/longitude coordinates.
 - 51. An article of manufacture comprising a program storage medium readable by a computer hardware device and embodying one or more instructions executable by the computer hardware device to perform a method for obtaining redline markup data for a map on a personal digital assistant, the method comprising:
 - (a) determining when a new redline object has been selected; and
- (b) obtaining a redline object while a stylus remains in contact with a 20 screen of the personal digital assistant.
 - 52. The article of manufacture of claim 51, the method further comprising:

- (a) displaying a text edit dialog box on the screen of the personal digital assistant; and
 - (b) accepting text user input in the text edit dialog box.
- 5 53. The article of manufacture of claim 52, the method further comprising synchronizing the redline markup data with a server.
 - 54. An article of manufacture comprising a program storage medium readable by a computer hardware device and embodying one or more instructions executable by the computer hardware device to perform a method for obtaining note markup data for a map on a personal digital assistant, the method comprising:
 - (a) determining when a new note object has been selected;
 - (b) accepting a user selection of an anchor point in a display of a map on a personal digital assistant;
 - (c) displaying a text entry screen on the personal digital assistant;
 - (d) accepting text user input in the text entry screen; and
 - (e) displaying an icon representative of a note at the anchor point.
- 55. The article of manufacture of claim 54, the method further comprising synchronizing the redline markup data with a server.

